

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 19415J	FOR FURTHER ACTION <div style="font-size: small; margin-top: 5px;">see Form PCT/ISA/220 as well as, where applicable, item 5 below.</div>	
International application No. PCT/FI 2004/000454	International filing date (<i>day/month/year</i>) 14 July 2004	(Earliest) Priority Date (<i>day/month/year</i>) 29 July 2003
Applicant Outokumpu OYJ et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II)

3. ☐ Unity of invention is lacking (see Box No. III)

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the drawings to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 2004/000454

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

The invention relates to a method and an apparatus for cooling a material to be removed from the grate of a fluidized bed furnace. Material at a high temperature is passed from the grate of the fluidized bed furnace into a fluidized bed cooler in charges of a given size by measuring the quantity of the material accumulating in the fluidized bed cooler. When the quantity of the material in the cooler has reached a predetermined limit value, the supply of material into the fluidized cooler is prevented. The charge is cooled in the fluidized bed cooler by fluidization air and via heat transfer into a cooling liquid circulation system and the temperature of the charge is measured. The charge is removed when the temperature of the charge has fallen to a predetermined limit value.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 2004/000454

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: F23C 10/24, F23C 10/28, B01J 8/24, F22B 31/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F23C, B01J, F22B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4227488 A (STEWART ET AL), 14 October 1980 (14.10.1980), figures 2,3, cited in the application --	1-26
A	US 5510085 A (ABDULALLY), 23 April 1996 (23.04.1996), figure 2 --	1-26
A	EP 0628767 A2 (FOSTER WHEELER ENERGY CORPORATION), 14 December 1994 (14.12.1994), figure 2, cited in the application --	1-26
A	US 4076796 A (REH ET AL), 28 February 1978 (28.02.1978), figures 1-3 --	1-26

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

2 November 2004

Date of mailing of the international search report

03-11-2004

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Tomas Lund/EK
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/10/2004

International application No.

PCT/FI 2004/000454

US	4227488	A	14/10/1980	CA	1132852 A	05/10/1982
				GB	2032598 A,B	08/05/1980
				JP	55049137 A	09/04/1980
				NL	187592 B,C	17/06/1991
				NL	7907309 A	09/04/1980
				SE	7907643 A	04/04/1980
				ZA	7904908 A	25/03/1981

US	5510085	A	23/04/1996	CA	2105204 A	27/04/1994
				CN	1061427 B	31/01/2001
				CN	1086302 A	04/05/1994
				EP	0595487 A,B	04/05/1994
				ES	2134242 T	01/10/1999
				JP	2631948 B	16/07/1997
				JP	6193827 A	15/07/1994
				KR	261720 B	15/07/2000

EP	0628767	A2	14/12/1994	CA	2119698 A	12/11/1994
				CN	1082174 B	03/04/2002
				CN	1095149 A	16/11/1994
				ES	2122167 T	16/12/1998
				JP	2573553 B	22/01/1997
				JP	6323744 A	25/11/1994
				US	5395596 A	07/03/1995
				US	5443022 A	22/08/1995

US	4076796	A	28/02/1978	AU	499771 B	03/05/1979
				AU	1295176 A	20/10/1977
				BR	7603522 A	04/01/1977
				CA	1079032 A	10/06/1980
				DE	2524540 A,C	23/12/1976
				FR	2313120 A,B	31/12/1976
				GB	1500096 A	08/02/1978
				GR	60266 A	20/04/1978
				HU	177477 B	28/10/1981
				IN	143800 A	04/02/1978
				IT	1081079 B	16/05/1985
				JP	1246341 C	25/12/1984
				JP	51147478 A	17/12/1976
				JP	59020380 B	12/05/1984
				NL	180387 B,C	16/09/1986
				NL	7604519 A	07/12/1976
				RO	72150 A	10/05/1982
				SU	1109041 A	15/08/1984
				YU	41291 B	28/02/1987
				YU	108676 A	31/05/1982
				ZA	7602959 A	27/04/1977

Translation

PATENT AND REGISTERING OFFICE

SEARCH REPORT

APPLICATION NO.	CLASSIFICATION, IPC7
FI 20031113	F23C 10/04

FIELDS SEARCHED (classification systems and class information)

IPC: F23C, F22B

DATABASES USED IN THE SEARCH

EPODOC

CITED REFERENCES

Category*)	Citation of document with indication	Relevant to claim No.
X	EP 0 628 767 A2 (FOSTER WHEELER ENERGY CORP.), 14.12.1994, p. 7, l. 54 – p. 8, l. 15, fig. 2	1, 14
X	GB 2 030 275 A (HAMJERN A/S), 2.4.1980, whole publication	1, 14
X	US 4,522,203 A (CHYROSOSTOMETE ET AL.) 11.12.1985 p. 4, l. 10-52, fig. 2	1, 14

continued on reverse side

- *) X Document of particular relevance when the document is taken alone
 Y Document of particular relevance when the document is combined with one or more other such documents in the same category
 A Document defining the general state of art which is not considered to be of particular relevance

Date 19 January 2004	Examiner Raimo Herjo
--------------------------------	--------------------------------

PATENTTI- JA REKISTERIHALLITUS

Patentti- ja innovaatiolinja
PL 1160
00101 Helsinki

TUTKIMUSRAPORTTI

PATENTTIHAKEMUS NRO	LUOKITUS, IPC7
FI 20031113	F23C 10/04

TUTKITUT PATENTTILUOKAT (luokitusjärjestelmät ja luokkatiedot)

IPC: F23C, F22B

TUTKIMUKSESSA KÄYTETYT TIETOKANNAT

EPODOC

VIITEJULKAISUT

Kategoria*)	Julkaisun tunnistetiedot ja tiedot sen olennaisista kohdista	Koskee vaatimuksia
X	EP 0 628 767 A2 (FOSTER WHEELER ENERGY CORP.), 14.12.1994, s. 7, r. 54 - s. 8, r. 15, fig. 2	1, 14
X	GB 2 030 275 A (HAMJERN A/S), 2.4.1980, koko julkaisu	1, 14
X	US 4,552,203 A (CHRYSTOSTOME ET AL.), 11.12.1985 p. 4, r. 10-52, fig. 2	1, 14

Jatkuu seuraavalla sivulla

☐

*) X Julkaisu, jonka perusteella keksintö ei ole uusi tai ei eroa olennaisesti ennestään tunnetusta tekniikasta.
Y Julkaisu, jonka perusteella keksintö ei eroa olennaisesti ennestään tunnetusta tekniikasta, kun otetaan huomioon tämä ja yksi tai useampi samaan kategoriaan kuuluva julkaisu yhdessä.
A Yleistä tekniikan tasoa edustava julkaisu.

O Tullut julkiseksi esitelmän välityksellä, hyväksikäyttämällä tai muutoin muun kuin kirjoituksen avulla.
P Julkaistu ennen hakemuksen tekemispäivää mutta ei ennen aikaisinta etuoikeuspäivää.
T Julkaistu hakemuksen tekemispäivän tai etuoikeuspäivän jälkeen ja valaisee keksinnön periaatetta tai teoreettista taustaa.
E Aikaisempi suomalainen tai Suomea koskeva patentti- tai hyödyllisyysmallihakemus, joka on tullut julkiseksi hakemuksen tekemispäivänä (etuoikeuspäivänä) tai sen jälkeen.
D Julkaisu, joka on mainittu hakemuksessa.
L Julkaisu, joka kyseenalaistaa etuoikeuden, osoittaa toisen julkaisun julkaisupäivämäärän tai johon viitataan jostakin muusta syystä.

& Samaa patenttiperheeseen kuuluva julkaisu.

Lisätietoja liitteessä

☐**Päiväys** **Tutkijainsinööri**

19.1.2004 Raimo Herjo